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European Renewable Energy Governance under the Hammer: Interrogating the Rise and Rise of the RES Auction

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ABSTRACT

As a renewable energy pioneer, the EU is a laboratory for policy instrument evolution and innovation. Following many years of debate about the relative merit of feed-in tariffs and tradable green certificates for promoting renewable electricity expansion in Europe, there is a new instrument in town. The renewable energy support (RES) auction has rapidly become the instrument of choice, *de facto* mandated by the European Commission under state-aid law. RES auctions are now the main instrument in many European countries. A common explanation for the adoption of RES auctions by EU member states is that the Commission requires their implementation under state-aid law, and member states acquiesced. This paper casts a critical eye over this "coercive Commission" explanation by constructing an account of the transition to auctions in Germany and Spain, each titans of EU renewable energy. By focussing on the necessary conditions for the coercive Commission argument – institutional compatibility and supportive domestic interest constituencies – we provide a qualified account of Commission action in this area and show a more dynamic and strategic approach to RES policy instrument harmonisation. We conclude by suggesting that future research may usefully examine the implications of a pan-European system of centrally coordinated auctions for the long-term future in of RES policy in the EU.

Key words: Europeanisation; policy convergence; renewable energy policy; state-aid law; Germany; Spain

1 Introduction

European Union (EU) renewable energy policy is a fundamental component of its broader energy and sustainability strategy and has had profound and varied impacts on policymaking in member states (Solorio and Jörgens 2017a). However, the EU's approach to renewable energy governance has been largely focused on the setting of targets and monitoring progress, as witnessed in the landmark renewable energy Directive (RED) legislated in 2009 in support of the EU 20-20-20 package which included targets for production of renewables as a proportion of energy consumption (European Commission 2009). A re-cast Directive on renewable energy (RED II) entered into force in 2018 as part of a 'Clean Energy for all Europeans' package that covers the period from 2020 to 2030 and includes a range of legislative commitments and other initiatives (European Commission 2018a; European Commission 2018b). Central to RED II are new targets for renewables production 2030 to be monitored and enforced through a new system of governance laid down in a new 'Governance Regulation'[1].

However, alongside this history-making phase of establishing the direction of travel for the European energy system, RED II also reveals a shift in how the EU envisages its role in renewable energy policy (Boasson 2019). The Directive, invoking article 107 of the TFEU, asserts the Commission's competence in assessing the compatibility of any and all measures member states plan to provide renewable energy support with the single market. In particular, the recast Directive, unlike the original, specifies the use, albeit with some exemptions and qualifications, of "*Market-based mechanisms, such as tendering procedures*" for allocating and determining the level of support for renewable energy producers (Article 19, RED II). In effect, the Commission has, through its interpretation of state-aid

[1] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council (see page 1 of this Official Journal).

law, specified not just the *policy*, but also the *instrument* used to comply with the policy (Fitch-Roy *et al.* 2019).

Significantly, the process of designing and selecting policy instruments can shed light on important areas of governance and the underlying politics (Lascoumes and Le Gales 2007). Rather than purely functional tools, instruments can be seen as political expressions of particular form knowledge about how to govern. Studying instrument development, innovation, and selection provides a unique perspective on political processes which are often otherwise obscured (Voß and Simons 2014). Following this logic, the instruments of the EU can illuminate debates about policymaking and European integration. In recent years, a rich body of literature illustrating the complexities and trade-offs inherent in the development and selection of governance instruments has emerged (Howlett 2009a; Howlett 2009b; Howlett *et al.* 2015; Howlett *et al.* 2017; Rogge *et al.* 2017; Rogge and Reichardt 2016; Trencher and Van Der Heijden 2019; Voß and Simons 2014).

Specifically, the policy tools and instruments are used in the EU to expand the proportion of electricity produced from renewable sources has been a topic of interest for some years (Haas *et al.* 2011; Kitzing *et al.* 2012; Klessmann *et al.* 2013; Winkler *et al.* 2016). In particular, instruments designed to provide 'operating aid' to renewable energy producers have been the subject of a great deal of scrutiny and the subject of lively disputes between various parts of the Commission and member states (Nilsson *et al.* 2009).

For example, in 2008, DG Competition (unsuccessfully) strove to insert proposals for an EU-wide tradable quota scheme into the original Renewable Energy Directive as means of establishing a pan-European market-based instrument to support renewable energy sources (RES) (Jacobs 2016; Jacobsson *et al.* 2009; Nilsson *et al.* 2009). This aspiration took a further six years to be realised, but patience paid off. In 2014, as part of a trend of growing Commission assertiveness over domestic RES policy instruments (Boasson 2019), new Energy and Environment Guidelines for state aid (EEAG) from 2014 to 2020 were produced that revisited the legal interpretation of the terms under which state-aid

exemption for RES support systems would be allowed. The most striking element of the new guidelines was the stated intention to ensure that support for RES be provided using auctions or other 'competitive instruments' with limited instances where approval for alternatives may be sought including small market sizes and immature technology (Fitch-Roy *et al.* 2019).

The EEAG guidelines have seen the Commission, especially DG COMP but also DG ENER, adopt a fairly uncompromising approach to auction design in which exemptions are limited and the preferred form of the auction is as close to the ideal of 'technology neutrality' as possible with the least possible scope for 'picking winners' by member states. For example, in 2017 the Commission included in its state-aid approval for the revised German support system a condition that multi-technology auctions are trialled in which technologies compete on price, a feature at odds with Germany's preferred approach[2] (BMWi 2018). The Commission is also creating pressure for member states to experiment with 'cross border' auctions in which one member states opens an auction to bids from projects based in another in order to promote regulatory harmonisation (European Commission 2018b).

In some ways, the response of member states to newly ascendant idea of RES auctions has been rather predicable. The UK, where market-based approaches to public policy are deeply ingrained, foreshadowed the Commission by two decades, bringing in the novel but largely ineffective non fossil-fuel obligation (NFFO) auctions in the early 1990s (Agnolucci 2005; Edge 2006; Mitchell 2000; Solorio and Fairbrass 2017) and committed to a new wave of auctioning in 2011 (DECC 2011). Meanwhile, by contrast, in Germany – spiritual home of the feed-in tariff – many stakeholders were initially resistant (Leiren and Reimer 2018). However, such resistance appeared to be short-lived and many member states developed or planned to develop renewable energy auctions. By the end of 2017, 18 member states had implemented (or had firm plans to implement) a RES auction system (CEER 2018). Auctions are being used by EU member states to support a wide array of renewable energy generation

[2] And, indeed, the growing literature on designing RES auctions (Mora *et al.* 2017)

technologies including onshore wind, offshore wind, solar PV and biomass. Across Europe, projects from 1MW to more than 1GW are participating in auctions, promoted by communities, utilities, multi-national developers and state-guided corporations.

In general, three types of functional explanation are put forward to account for the Commission's adoption and pursuit of the renewable energy auction:

1. Cost efficiency: RED II states that "Member States shall ensure that support for electricity from renewable sources is granted in an open, transparent, competitive, non-discriminatory and cost-effective manner"
2. Poor price signals leading to very rapid RES expansion, impacting investment in adequate other forms of generation
3. Internal market fragmentation through the non-harmonisation of approaches to RES markets across the EU

Additionally, it has been argued that a self-propagating and expansive expert 'instrument constituency' has contributed to a sense that the auction's 'time has come' (Fitch-Roy *et al.* 2019), which has been particularly potent due to growing 'constitutionalisation' in the EU and an especially entrepreneurial Commission (Boasson 2019).

It is generally assumed that through the implementation of the EEAG, the Commission is directly exerting its influence over member state policy choices by requiring, among other developments[3], RES auctions – leading to normative and legal concerns over subsidiarity and Commission constitutionalisation (Boasson 2019; Kahles and Pause 2019). However, in this paper, we cast a critical eye over this logic to develop a more complete explanation for the apparent zeal with which member states have overcome their reservations and implemented RES auctions.

[3] Including sliding premium systems for structuring support payments and prohibiting payments at times of negative prices (Kahles and Pause 2019)

The remainder of this paper proceeds as follow. Section 2 provides an overview of the concept of renewable energy auctions, arguing that it represents the 'Swiss army knife' of RES policies. Section 3 develops an analytical framework by drawing on the literatures of policy convergence and Europeanisation. Section 4 traces the recent history of RES support policy in Germany and Spain up to and including the adoption of RES auctions. Section 5 discusses the cases in terms of contemporary debates about policy convergence and Europeanisation and concludes the paper.

2 Auctions: the Swiss army knife of RES policy instruments

The auction, the solicitation and ranking of bids, has structured economic relationships since antiquity (Krishna 2010). The concept has been applied in a wide range of public policy areas, including the allocation of rights to natural resources, oil reserves and radio frequency spectra (Binmore and Klemperer 2002; Klemperer 2004). However, it is important to note that the application of auctions as a renewable electricity governance instrument is distinct from the instruments conventionally considered 'support mechanisms', such as feed-in tariffs (FiTs) or tradable quotas.

Renewable electricity auctions tend to be characterised by two primary features. Firstly, access to financial support is allocated to prospective electricity producers at discrete intervals in which limited support is available. This contrasts with other support instruments such as FiTs or tradable green certificates (TGC), which are, broadly, open to eligible applicants at all times until the scheme is revised, for example to account for target fulfilment. Secondly, the value of the support, usually representing a price-supplement per unit of production, is determined through ranking of applicants' price *bids*, with the volume of support, measured in overall cost or generation capacity, filled from lowest price to highest. This differs from both FiTs, which offer a known fixed-price, and to TGCs, the value of which may fluctuate throughout the tenure of support (del Río 2017; Fitch-Roy 2016).

Thus, RES auctions, rather than acting as a support instrument *per se*, perform an allocative function that can enhance policymakers' ability to control the volume of new renewable electricity projects,

while applying a degree of competitive pressure on bidders to offer their true costs. In other words, the financial support awarded through an auction is structured independently from the allocation. In practice, the most common 'awards' offered to auction winners are a fixed per-unit price for production, a very similar offer to that available through a FiT (Szulecki 2017) or a sliding premium system or 'contracts for difference' in which payments are calculated with reference to a market index (Fitch-Roy 2016).

While experience has grown substantially since the UK's experiments in the NFFO[4] in the 1990s, the implementation of auction to support renewable energy still presents very significant challenges to policymakers even though the accumulated analyses of auction performance and subsequent refinement mean that RES auction designers have a wealth of material to guide their decisions. Much of the material observes (and proposes measures to correct) bidding strategies and behaviour that may lead to sub-optimal outcomes, such as the infamous 'winner's curse' in which *ex ante* bids overestimate the contract value or underestimate bidders' costs, often making the project undeliverable (Klemperer 2004; Thaler 1988). Other difficulties include the reconciliation of policy goals beyond simply lowest cost deployment such as industry development, technological innovation and social goals (del Río *et al.* 2016; Kitzing *et al.* 2016).

A major characteristic of the RES auction is the extreme sensitivity of auction outcomes (i.e. relating to which projects receive how much support) and a large number of interrelated design elements, combinations of which can create a practically unlimited number of unique auction design. Figure 2 shows an overview of the basic structure of RES auction design while Figure 3 the range of interrelationships between design choices and intermediate and final policy outcomes:

[4] And others (del Río and Linares 2014)

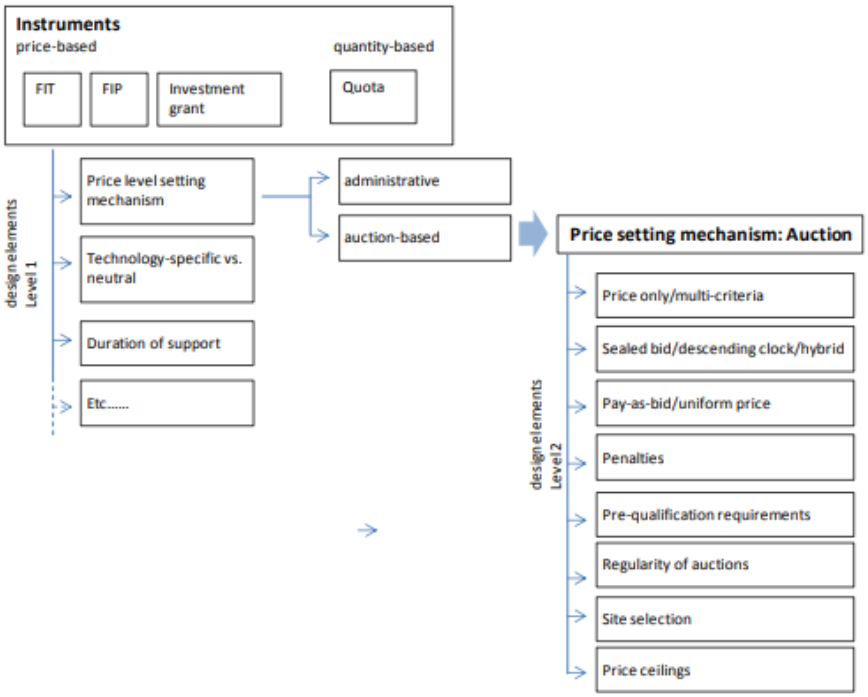

Figure 1: RES auction design elements (del Río *et al.* 2015b)

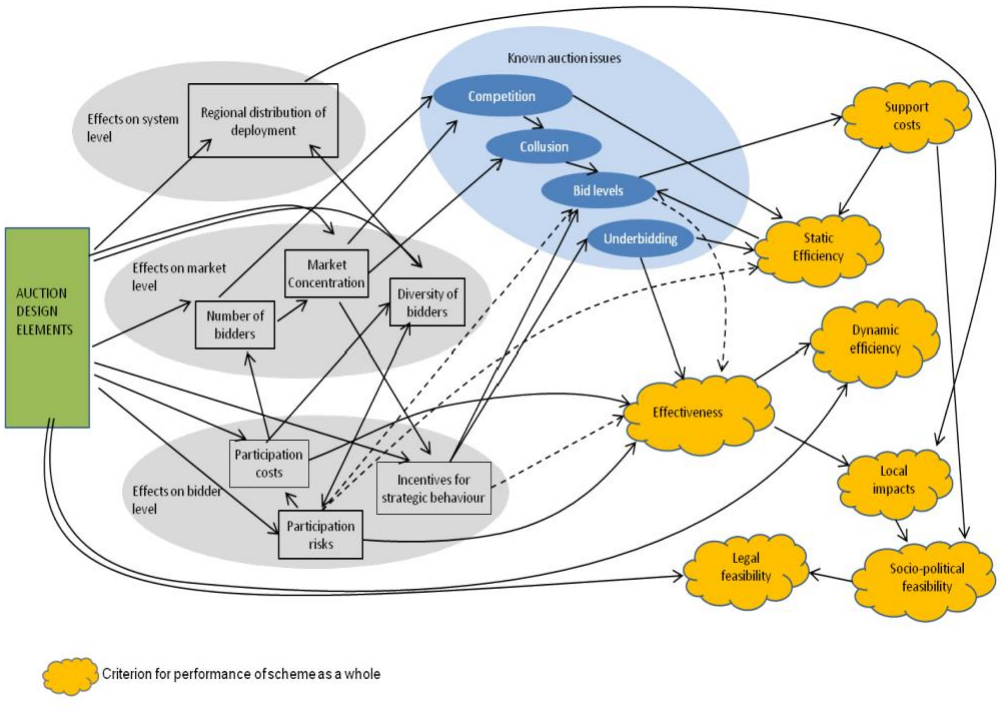

Figure 2Links between auction design and policy outcomes (del Río et al. 2015a)

Indeed, the RES auction can be designed to not only to suit a variety of economic and technological contexts, it can also be adapted to pursue or prioritise a very wide range of policy goals in addition to

cost-minimisation. In effect, not only is the RES auction an extremely *sharp* instrument requiring very specific and detailed design (Fitch-Roy 2017), but it is also a very *adaptable* concept and may be thought in this way as somewhat like a Swiss-army knife. For example, the policy can be designed to support local industry, ensure lowest cost, or pursue various social goals. Even under the state-aid constraints within the EEAG, marked variation in auction design and outcomes is becoming apparent in the EU. Additionally, although usually presented and discussed as a 'market instrument' the scope for auction design and implementation also encompasses distinctly 'regulatory' approaches to public policy (Matsuo and Schmidt 2019).

In fact, we observe that the only truly universal aspect to all RES auction implementations is, through its demands of highly specific scheduling and the appointment of an auctioneer, a very substantially centralised process of deciding how much renewable energy gets built and, to a greater or lesser degree, where and by whom.

3 Analytical framework: policy convergence and Europeanisation

In this paper, we set out to critically examine the commonly held belief that the European Commission's requirement to hold auctions was the dominant factor explaining member state implementations (Kahles and Pause 2019). The adoption of RES auctions accelerates the already significant convergence between support instruments between EU member states (Fitch-Roy 2016; Jacobs 2016). It is important to note, however, that the degree to which convergence in instrument design is representative of wider policy convergence (when one also considers objectives, implementation and outcomes) is somewhat moot (Strunz *et al.* 2019). The growth of renewable energy auctions in EU member states is arguably a direct response to changes in EU policy, specifically

the EEAG, as part of the ongoing state-aid modernisation programme[5] (Boasson 2019; Fitch-Roy *et al.* 2019; Leiren and Reimer 2018).

While it remains a contested concept, at a fundamental level, the concept of Europeanisation tend to be invoked to describe the process(es) by which influence of EU decision making leads to changes in domestic politics and policymaking in member states over time. More specifically, it can be thought of as '*a situation where distinct modes of European governance have transformed aspects of domestic politics*.' (Buller and Gamble 2002: 17). This definition of Europeanisation is apposite, since we have argued elsewhere that among the implications of the state-aid modernisation programme underway since 2012 is a shift in renewable energy governance mode at the EU level (Fitch-Roy *et al.* 2019). Therefore, we approach this analysis of the renewable energy auction in Europe as both an instance of, and part of a process of, Europeanisation.

The EU is a multi-level system and therefore contemporary research acknowledges that Europeanisation is a multidimensional relational rather than a simply top-down phenomenon (Hofmann *et al.* 2019; Leiren *et al.* 2019). Convergence of public policy in the EU can also be broadly categorised as either 'coercive' with power asymmetries creating pressure to change or harmonise or 'voluntary' where governments independently arrive at similar policy conclusions, draw similar conclusions through experience of a shared competitive environment or participate in some degree of mutual policy learning (Jacobs 2016).

[5] State-aid modernisation (SAM) package from 2012- broad "better regulation" and includes General Block Exemption Regulation, De Minimis Regulation, Regional Aid Guidelines, Research, Development and Innovation Framework, Important Projects of Common European Interest Communication, Risk Finance Guidelines, Airport and Aviation Guidelines, **Energy and Environmental Aid Guidelines**, Rescue and Restructuring Guidelines

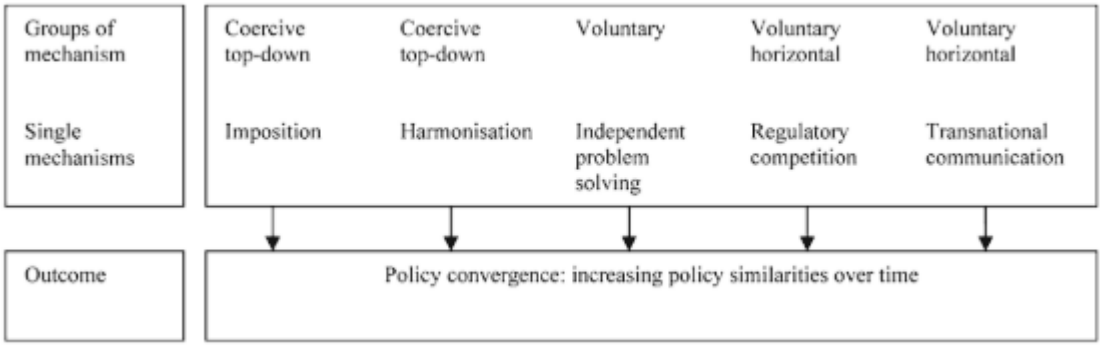

Figure 3: Mechanisms of policy convergence as summarised by Jacobs (2016) (see also: Holzinger *et al.* 2008)

We therefore draw on the Europeanisation literature to construct a 'strawman' analytical framework based on the assumption that RES auctions are the results of a top-down, coercive mechanism of convergence initiated by the Commission (Solorio and Jörgens 2017b). In essence, we seek to test this assumption on its own terms.

Top-down influence of EU policy on domestic politics can be said to occur through three distinct but often co-existing mechanisms (Knill and Lehmkuhl 2002):

- institutional compliance
- changing domestic opportunity structures
- framing domestic beliefs and expectations

Prima-facie, the imposition of RES auctions on member states appears to represent a very strong version of institutional compliance; member states' compliance with the Commission's requirement to use RES auctions requires, in some cases, very substantial institutional adjustment. In many countries, the shift from feed-in systems to auctions has necessitated an entirely new approach to renewable energy policy, with new capacity, agencies and practices.

However, this mechanism of top-down Europeanisation tends to rely in the first instance on 'institutional compatibility', with compliance unlikely in situations where fundamental domestic changes are required (Knill and Lehmkuhl 2002). Secondly, even where domestic institutions are

broadly compatible with the European policy, change at the domestic level is contingent on favourable domestic opportunity structures. That is to say, adoption of the policy occurs only where the European policy empowers domestic groups to pursue their interests by advocating and implementing for the change (Knill and Lehmkuhl 2002).

The case of RES auctions in the EU, then, presents something of a puzzle. In 2014, few EU member states' renewable energy governance systems were structured with auctions in mind. Indeed, many of them entirely lacked the necessary administrative expertise or organisational structures needed to hold such an auction. Additionally, domestic interest constellations were distinctly unfavourable to the idea, with many groups – such as the formidable renewable energy lobbies and administrators in some countries - actively hostile. Nevertheless, RES auctions appear to represent rapid policy convergence under coercion from the Commission – something generally considered to be highly unlikely (Dimitrova and Steunenberg 2000)

This paper addresses two questions. First, given the challenging domestic institutional conditions for RES auction uptake, how did the EU achieve such apparently willing member state compliance, so fast, with the requirement to hold RES auctions? Secondly, what can it tell us about contemporary Europeanisation and European integration?

In order to address the questions above, we present accounts of the transition from feed-in tariff systems to auctions in two countries, Germany and Spain. In particular, we examine two variables essential to the credibility of the coercive Commission explanation of RES auction uptake:

1. The compatibility of extant domestic institutions with RES auction implementation – *how profound were the required legal and administrative changes to enable implementation?*
2. The likely acceptability of the new RES auction system to key domestic interests – *was there a supportive constituency for RES auction implementation?*

4 Two roads to RES auctions: Germany and Spain

In this section we examine two case studies of member state RES auction implementation paying particular attention to institutional capacity and domestic interest constellations – factors previously identified a significant in top-down coercive policy convergence. The cases we present are Germany and Spain, two 'titans' of European renewable energy deployment that both moved, under very different circumstances, from a feed-in system to an auction system in line with the Commission's guidelines between 2014 and 2016. Importantly for our comparison, neither Germany nor Spain had *any* institutional experience with the design and implementation of RES auctions before 2014. Both Spain and Germany have seen very rapid expansion in the production of renewable electricity, as shown in the figure below:

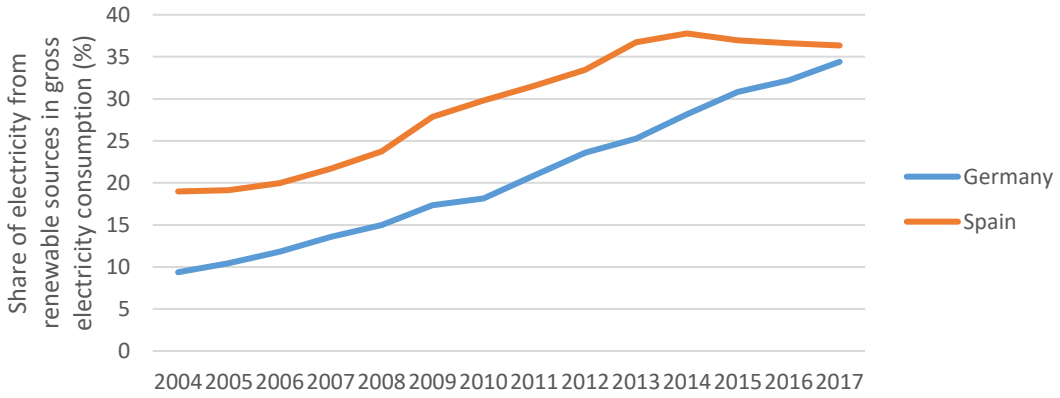

Figure 4: Share of electricity from renewable sources in gross electricity consumption, 2004-2017 (Spain and Germany) - Eurostat

4.1 Shapeshifting RES policy in Germany

Germany has had a feed-in system for a range of renewables in place since 1991, originally structured as a supplement to the wholesale power price and replaced by EEG in 2000 which guaranteed a fixed price per unit of production for a fixed period of time (Mitchell *et al.* 2006).

The feed-in component of the German EEG is one of the most analysed and emulated renewable energy policy instruments in Europe, with widespread adoption creating at least the impression of

convergence (Jacobs 2016; Kitzing *et al.* 2012). However, the EEG model has never been static and a series of reforms have led to fundamental changes over time, largely driven by the challenges of rapidly maturing technology and industries as well as growing political salience of renewable energy funding (Kitzing *et al.* 2019a). Germany's approach to supporting renewable energy has also been a source of tension with the Commission, with periodic legal challenges over its compliance with single market principles (Leiren and Reimer 2018). Since the ECJ finding in the 'PreussenElektra' case in 2001 which determined that Germany's approach was *not* state-aid, however, there has been an uneasy standoff (Boasson 2019; Haak and Brüggemann 2016; Kuhn 2001; Leiren and Reimer 2018).

But over recent years, the principles of the feed-in system have gradually slipped in favour of more market-based approaches (Kitzing *et al.* 2019b). For example, in 2012[6] the EEG law made provision for 'direct marketing' of electricity from renewable sources which enabled generators to sell directly into wholesale power markets and receive a 'market premium'[7] calculated as the difference between a measure of the average monthly power price and the relevant tariff (annex 4, EEG, 2012). In the 2012 iteration of the law, a generator could switch between the tariff and direct marketing on a monthly basis. In 2014, the EEG introduced 'compulsory direct marketing' which strictly limits the circumstances under which a generator qualifies for the fixed tariff, effectively mandating the direct marketing option, placing caps on new capacity, and a 'growth corridor' to control the deployment rate. Finally, the 2017, the EEG marked the fulfilment of the German government's EEAG obligation to apply auctions to renewable energy support policy with a tendering system developed and trialled alongside the feed-in system from 2015[8] and rolled out to become the default from 2016 (Kitzing *et al.* 2019a; Leiren and Reimer 2018).

[6] Chapter 2. Germany. Act on granting priority to renewable energy sources (Renewable Energy Sources Act – EEG). (2012).

7 Generators also receive a supplement to compensate for the cost and risk of direct power market participation

[8] A pilot scheme for ground-mounted solar PV (Tiedemann et al. 2015)

4.1.1 Institutional compatibility

The national German institutions that underpinned the EEG before 2012 were not compatible with the EU's demands of running renewable energy auctions. The principal tasks associated with feed-in tariffs are the system of cost estimates and predictions that underpin the setting of the feed-in price and managing eligibility of generators. At the same time, the Energiewende is largely conceived to be a bottom-up process led and enabled by diverse and dispersed civil-society involvement (Haas 2019), a characteristic clearly at odds with the highly centralised decision making inherent in nationally organised auctions (del Río *et al.* 2015c).

However, the institutional context was in flux. Through 2012 and 2014, the EEG adopted characteristics that significantly altered the feed-in system. As direct marketing and the sliding market premium were layered (Thelen 2004) onto the established system, the EEG was 'morphing' to become a more 'market-based' instrument (Kitzing *et al.* 2019a).

4.1.2 Interest Constellation and Opportunity Structures

By late 2013, the legal and political situation surrounding German RES support instruments was fraught. The ongoing *Energiewende* process had created substantial constituencies of both support and resistance for the feed-in system. Renewable energy producers and environmental groups were fiercely defensive of the principle of open, non-discriminatory RES policy, while other groups, most notably the utility companies that were suffering substantial financial losses that they blamed on rising renewables production, were insistent on a controlled allocation system such as auctions (Leiren and Reimer 2018). At the same time, the overall cost of financing the Energiewende was a key issue in Germany's 2013 federal elections. Following the election, newly appointed minster for the *Energiewende*, the SDP leader Sigmar Gabriel continued to raise the issue of costs as an important issue.

Into this delicate situation, on the same day in December 2013, the European Commission launched a both a formal state-aid enquiry and a consultation on new guidelines that would become the EEAG.

The Commission claimed that the current iteration of the EEG was substantively different from the PreussenElektra case and therefore incompatible with the internal market. The Commission's particular gripe concerned exemptions for some industries from contributing to the levies that funded the feed-in system.

Following intense bi-lateral negotiations with the German government, the 2014 EEG was signed off by the Commission as 'single market compliant' to include numerous changes including compulsory direct marketing and the growth corridors.

4.1.3 The result - Germany

The long-standing and oft-vexed relationship between DG Competition's vision of the single market and the German government's EEG came to a head in 2013. While the institutional situation in Germany was far from prepared for the delivery of an auction system, the Commission was able to use the threat of state-aid violation (which would have been potentially catastrophic for the *Energiewende*) to 'nudge' Germany's institutions into shape, so that by the time the EEAG 'bit' in 2016[9], the EEG was far closer in form to an auction system.

However, the auction system developed in Germany from 2015 is notable for several characteristics that mirror the principles of the *Energiewende*. Firstly, local community involvement in the development of RES projects and diverse, innovative ownership has been a cornerstone of the *Energiewende* for many years (Moss *et al.* 2015), something that conflicted with the generally assumed and empirically validated bias in RES auctions towards larger, more sophisticated companies (Gephart *et al.* 2017; Winkler *et al.* 2018). In response, the principle of 'actor-diversity' was central to the design of the German auctions from the very beginning, starting with the pilot in 2015 (Tiedemann *et al.* 2015). Small and community-led projects were thus provided substantial exemptions from some

[9] The date by which auctions must replace the existing instrument as the main tool for RES support

of the more demanding criteria which larger actors must comply[10] (Lundberg 2019). Similarly, attempts were made to normalise the highly variable resources available across Germany to maintain geographically dispersed growth through a 'reference yield model' that limited the competitive advantage of sites with low generation costs due to strong resource and high production (Tews 2018).

4.2 Boom, bust and policy vacuum in Spain

Spain's 'rollercoaster' experience with renewable energy policy over the last decade or so has been well-documented. Since 1998, a system of feed-in tariffs and premiums has supported the expansion of renewable energy capacity in Spain, leading to some of the largest growth rates and overall expansion in the EU (Alonso *et al.* 2016; Mir-Artigues *et al.* 2015). In 2004, and 2007, reforms were introduced which, among other things, sharply increased the profitability of some types of new RES projects under the feed-in system leading to very rapid growth (Mir-Artigues *et al.* 2015). Solar PV illustrates just how quickly renewable electricity capacity grew in Spain from 2007. In sixteen months between June 2007 and September 2008, an average 178MW of new solar PV capacity was installed per month, outstripping the overall policy target of 371MW within three months and, by the time the policy was revised in September 2008, by a factor of almost eight (Mir-Artigues *et al.* 2015).

In 2008, rising alarm in the Spanish government at the cost of supporting rapidly growing renewables saw measures introduced to try and contain the cost. Rates were reduced several times, new registration processes implemented, eligibility tightened and new charges imposed on RES projects and degression[11] introduced (del Río and Mir-Artigues 2012; Mir-Artigues *et al.* 2018). However, such efforts proved ineffective in the face of falling technology costs, cheap credit, rapid solar PV build

[10] Resulting in a notable policy disaster, illustrating the sensitivity of auction outcomes to design (Tews 2018)

[11] A system in which the revenue offered to new project declines with time to reflect decreasing costs. Degression can be a fixed programme determined on policy implementation and/or it can be calculated periodically based on capacity growth with high growth resulting in lower tariffs for new plants

schedules and slow responses within the Spanish administration (Río González and Mir-Artigues 2014).

The rapid growth of RES in Spain combined with generalised overcapacity in electricity production, and falling demand due to recession combined to create numerous technical, commercial, economic and political problems for Spain's energy system (del Río and Janeiro 2016). In particular, the regulated tariffs from which levies were drawn to fund the support payments (as well as other system costs) proved inadequate to cover the rapidly growing liability leading to a growing 'tariff deficit' from 2006. By 2013, the deficit had reached €30bn – 3% of Spain's GDP (Johannesson Lindén *et al.* 2014).

In 2012, a panicked government introduced a temporary moratorium on all renewable energy support, effectively removing all preferential treatment including tariffs for new projects and also affecting operational plants (López Prol 2018). Since the suspension of the scheme, a system of tightly regulated returns has been introduced to allow the owners of operational renewable energy projects to recoup their investment subject to a 'reasonable profitability' criterion derived from the 10-year government bond rate (del Río 2016). In 2016, Spain held the first of a planned regular series of auctions for support to new RES capacity.

4.2.1 Institutional compatibility

The conditions that led to the 2012 moratorium on renewable energy support in Spain created a situation in which there was effectively no meaningful policy in place to support investment new renewable electricity capacity (Alonso *et al.* 2016). However, the political economy of Spain's energy system is characterised by high levels of centralised decision making focussed on a single ministry and a relatively small number of large corporations (Haas 2019), arguably more conducive to the centralisation inherent in national auction processes (del Río *et al.* 2015c).

4.2.2 Interest Constellation and Opportunity Structures

This dramatic hiatus in policy development created what del Rio and Mir-Artigues (2014) describe as a 'lose-lose' for all stakeholders. The solar PV liabilities that had accrued during the boom years would

weigh on the electricity system for decades, and the workforce of the burgeoning renewable energy industries of Spain was reduced by three-quarters. At the same time, Spain remained barely on track to meet its EU targets for renewables expansion for 2020[12]. The criticism of the government from nearly all quarters was intense.

In this environment, the move to implement RES auctions proved far less controversial than it might have done among renewable energy interests. Indeed, stakeholders that might have been expected to resist auctions *vis-à-vis* alternatives such as FiTs appear to have acquiesced to the change in approach and shifted to contributing to the development of auction design (del Río 2016).

4.2.3 The result - Spain

The main objective of introducing auctions in Spain was to put in place a policy that fulfilled Spain's obligations under the RED, and to do so under the tightest cost-control regime possible. Consequently, the first auctions proposed actually favoured re-powering of existing projects over new-builds as well as closely regulated additional remuneration to cover investment costs rather than payment per production is standard as in most other countries (del Río 2016). Subsequent auctions have seen such a low level of bids so as to effectively commit developers to reliance on electricity sales for revenues.

5 Discussion and conclusions

While state-aid law has clearly played a significant role in the shift to RES auctions by member states (or at least the timing of the implementation), as anticipated in the introduction, our account of the introduction of auctions adds some qualifications to the 'coercive Commission' explanation. We discuss several of these in turn before reflecting on the significance of the findings for the literature on RES policy convergence and EU climate and energy policy more widely.

[12] Although most of any shortfall is likely to be in the heating/cooling and transport sectors

The first point to observe is that 'institutional compatibility' is a dynamic rather than a static concept. While Germany's RES policy was not compatible with the demands of holding auctions in 2013, the institutional environment was changing fast. German policymakers were under political pressure to do 'something' about the salient issue of the cost of supporting RES expansion and steps were already in progress to re-cast the FiT system towards a more market-oriented and cost-controlled model. Into this environment of flux, the Commission added pressure through the threat of a state-aid enquiry and worked closely with the German government to produce a revised EEG that was compliant with the EU law. In this way, many of the building blocks of a transformed support system for RES in Germany were in place ahead of the deadline imposed by the EEAG. Meanwhile Spain's FiT system had for all intents and purposes imploded under the weight of poor design, rapidly falling technology costs, and declining electricity demand in the wake of the financial crisis and economic recession. In this context, Spain's RES support institutions were in crisis and likely candidates for redesign regardless of the action of the Commission.

Germany's constituency of support for FITs was weakened by the politics of RES costs while those domestic industries more likely to prefer some form of volume control system were emboldened. Similarly in Spain the dismantling of the domestic RES industry meant that any instrument that could offer financial stability for the sector after the 2012 fiasco was welcomed by erstwhile auction-sceptics.

The differences in auction design between Germany and Spain highlight the flexible nature of the instrument. Spain's system was determinedly focussed on cost-control, while Germany's made a reasonable effort at recreating the essence of the FiT in auction form, with strong preferences for small projects and local participation along with the 'reference yield model' approach to normalising geographical variation in resource. It is telling that the Spanish and German auctions are far more different than ever their FIT systems were.

Overall, rather than challenging the centrality of the Commission in the process of RES auction adoption, we have shown that the way in which the Commission exercises its very substantial power in this arena is more subtle and dynamic that previously assumed. In German and Spain the Commission was offered two very different windows of opportunity to fulfil its long-held ambition to harmonise RES instruments. The malleability of the RES auction concept and the growing scope for action provided by the state-aid modernisation programme provided the tools to steer rather than coerce member states towards auctions.

A critical appraisal of the stated goals of the auction promotion by the Commission leads us to wonder: "to what end?". Given the drive to encourage member states to consider cross-border RES auctions and the manifest willingness of the Commission to exert power in this area, the possibility of a pan-European system of auctions coordinated at the European level seems a distinct possibility – especially in a context of European rather than national governance of RES target fulfilment. Further research should offer some useful findings on the legal and political implications of such a system. At the same time, cost reduction in RES production and the changing nature of electricity markets puts the future role (and indeed necessity) of the RES auction in doubt. Questions about an enduring model for RES auctions remain: What is being auctioned in the future? By whom? These questions sit within the context of a future where some RES developments no longer needs revenue support but may need routes to market and revenue certainty. Given these lingering uncertainties and queries, we contend that more research is needed in this area.

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